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CHANGES IN DEVELOPMENTAL TRENDS OF CAREGIVER–CHILD INTERACTIONS AMONG THE SAN: EVIDENCE FROM THE !XUN OF NORTHERN NAMIBIA

Akira TAKADA

Graduate School of Asian and African Area Studies, Kyoto University

ABSTRACT The San have been the subject of extensive research with respect to their foraging lifestyle that is assumed to date back to antiquity. I conducted field research among the !Xun San, who have had close associations with the neighboring agro-pastoralists, in order to deepen understanding in this area. As anticipated by previous studies on the influence of sedentarization, !Xun children were increasingly engaged in the care of their younger siblings or cousins. These studies also predicted early weaning from breastfeeding. Indeed, the transition from breastfeeding to solid baby food occurred primarily during the second year after birth, regardless of the mother's next pregnancy, among the present-day !Xun. However, several findings did not meet the expectations raised by previous studies. Despite the difference in subsistence patterns, the trend toward parity among sedentary !Xun women was quite similar to that of nomadic Ju|'hoan women. The developmental transition involving touching and holding by the mother was similar among the Ju|'hoan and the !Xun. Gymnastic behavior preceding unaided walking of children persisted, even among the sedentary !Xun, mediated by differences in folk knowledge regarding such gymnastic behavior. Based on this evidence, I reconsidered the relationships among ecology and subsistence patterns, parental ideology, and patterns of caregiver-child interactions.

Key Words: Childhood; Hunter-gatherers; Caregiving behavior; Socialization; Adaptation.

CAREGIVER-CHILD INTERACTIONS AMONG THE SAN

I. Introduction

The San, who are indigenous to southern Africa, have been the subject of extensive research with respect to their foraging lifestyle. Given that throughout most of our past, humans lived in foraging societies, the San lifestyle is considered to reflect ancient ways. In his influential work on San infancy, Konner (1977: 288) noted that it is “essential to pursue the study of modern hunting and gathering peoples as an adjunct to the study of human evolution.” In particular, the San may provide vital clues to understanding the essence of human caregiving, child behavior, and development. The importance of such study lies not primarily in unique San ethnological features, but in their “position as representative of a group of societies resembling, in their basic subsistence ecology, the original human sociocultural form” (Konner, 1977: 289). Accordingly, some features of San infancy and childhood have been considered representative

of hunter-gatherers, leading to a set of generalizations that Konner (2005: 19) termed the hunter-gatherer childhood (HGC) model. To deepen this discussion, I briefly describe the characteristics of San caregiving behaviors.

The San actually consist of several clusters of people. Among these, the Ju|'hoan⁽¹⁾ are the most known to outsiders. A Harvard University project in the 1960s led by Irvén DeVore and Richard Lee began contact with a population of about 1,000 Ju|'hoan individuals living in the northwest corner of the Kalahari Desert.

The Ju|'hoan mother–young child bond was found to be long and extremely close, with the degree of mother–infant physical contact much greater than that between their American and English counterparts (Konner, 1977). Konner found that in the first months after birth, infants stayed in passive physical contact with their mothers for about 70% of all daylight hours. Infants were fed whenever they cried and frequently when they did not cry (Konner, 1977: 292). Mothers nursed their infants briefly, usually for a few minutes, at frequent short intervals. Although the rate of passive physical contact declined gradually (Konner, 1977: 292–294), infant age was not related to the bout length or nursing time (Konner & Worthman, 1980).

Konner (1977: 290) also reported that the mother–young child dyads were typically in constant contact with relatives and friends. Konner (1977: 297–298) observed frequent physical contact not only between mother and child but also between other adults and young children. Although children were closely supervised, they were given considerable leeway despite their continuous physical proximity to adults. Adults were ubiquitous but had a nondirective attitude towards nearby children (Draper, 1976: 206). These researchers suggested that such close relationships provided infants with abundant food, security, and psychological support.

Traditionally, children were not weaned until they were three or four years old, or until their mother became pregnant again (Konner, 1977; Draper, 1976: 214–215). The late weaning was considered to be interrelated to the long interbirth interval of the Ju|'hoan. According to Lee (1979), the mean birth interval among nomadic Ju|'hoan between 1963 and 1973 was 44 months. This puzzled investigators because, at that time, the Ju|'hoan did not practice contraception or refrain from sexual intercourse after childbirth (Lee, 1979; Howell, 2000). Konner & Worthman (1980) postulated that frequent breastfeeding was the key variable in maternal gonadal suppression that could account for the long interbirth interval.

After the long period of nursing, children began to develop a strong attachment for a child group consisting of multi-aged children. The transition from close mother–child bond to a multi-aged child group began at the end of the first year and was largely complete several months after the birth of the next sibling, at age three or four. Older children in the group would take over many caretaking functions, thus largely obviating the need for parental vigilance after age three or four (Konner, 1977: 290). It should be noted that the child groups engaged in few foraging activities or daily chores. Instead,

children had ample time to play, through which they became familiar with the natural environment. These characteristics are thought to be inseparable from their nomadic lifestyle that requires a long time for socialization (Draper, 1976: 209-214). Cultural transmission in general is postulated to be carried out more on this child-to-child basis than from adult to child only (Konner, 1977: 290).

II. Purpose of This Study

Although the essence of human caregiving, child behavior, and development has been discussed based on the above findings, some premises of these studies must be questioned. First, virtually all modern studies among the Ju|'hoan have been carried out in only a few, adjacent locations, such as Nyae Nyae and Dobe, located in the northwest corner of the Kalahari Desert (Barnard, 1992: 40). Thus, insufficient data are available to generalize about the San, much less about all human foragers. Moreover, recent research has indicated that marked cultural diversity exists among groups of San. Differences have been found in subsistence strategies, residential patterns, politics and ideologies, and kinship systems, among other practices (e.g., Barnard, 1992; Kent, 1996; Takada, 2008b). In the domain of caregiving, recent empirical studies have begun examining these behaviors from a comparative perspective (e.g., Takada, 2004; Hewlett & Lamb, 2005).

Second, since the study of child development has emphasized "adaptationist" approaches (e.g., Whiting & Whiting, 1975; Lee & DeVore, 1976; LeVine et al., 1994), researchers have often assumed that ecology and subsistence patterns strongly influence behavior and thought in relation to caregiving practices. On the other hand, after reviewing social anthropological studies, Barnard (2002) postulated that "mode of thought" (or, in the context of this article, parental ideology) persists beyond "mode of production" in post-foraging societies contending with rapid transformation. These assumptions should be reexamined. My research has shown that groups of San engage in several distinctive caregiving behaviors irrespective of whether their lifestyle is sedentary or nomadic. However, their interpretation of some of these caregiving behaviors differed considerably depending on whether they have a sedentary or nomadic lifestyle (Takada, 2004; 2005a; 2005b). Therefore, it is insufficient to explain the pattern of caregiving behaviors among groups of San by ecology and subsistence patterns alone. Some behavioral patterns may persist, even though subsistence patterns have changed. Parental ideology may be modified flexibly, depending on the circumstances. Broader perspectives and more substantial data are required to discuss the relationships among ecology and subsistence patterns, parental ideology, and patterns of caregiver-child interactions.

The above two aspects are actually mutually related. To look into this issue more analytically, I focused on the !Xun San living in north-central Namibia. This group is highly suitable for studying cultural diversity with respect to caregiving behavior among groups of San, since the !Xun are socio-culturally closely related to the Ju|'hoan and have close associations with agro-pastoral

peoples. The research design provides for a “natural experiment,” in which the effect of a mobile subsistence pattern on these behaviors is studied, since the !Xun are less nomadic than the Ju|’hoan. Accordingly, I have conducted field research since 1998 among the !Xun, based in Ekoka village located in north-central Namibia. In this article, I describe the developmental transition of caregiver–child interaction among the !Xun. Moreover, I compare the trend to that of the nomadic Ju|’hoan and other (post)foraging societies. First, however, a brief outline of the ethnographic circumstances of the !Xun and Ju|’hoan is necessary.⁽²⁾

III. The !Xun and Ju|’hoan

The !Xun and Ju|’hoan exhibit several similarities that form the basis for a “regional structural comparison” (Barnard, 1992) between the two societies (Table 1).

The two groups share moderately related languages. Since Bleek’s (1929) description of the languages, San languages have traditionally been classified into northern, central, and southern language families (Traill & Vossen, 1997). According to this classification, both the !Xun spoken in Ekoka and the Ju|’hoan spoken in Nyae Nyae and Dobe belong to the northern family. Furthermore, the northern family is subdivided into several groups. König & Heine (2001) provide a comprehensive framework for locating the !Xun spoken in Ekoka in relation to various related languages. In this classification, the !Xun spoken in Ekoka belongs to the W2 lect, while the Ju|’hoan spoken in Nyae Nyae and Dobe belongs to the E1 lect (König & Heine, 2001: 2).

My ongoing study (Takada, 2008b) has also revealed that, although several cognate kinship terms are recognized between the !Xun and Ju|’hoan, their kinship and naming systems are also characterized by considerable differences. For example, !Xun kinship terms are classified as the “Hawaiian” type, in which both cross and parallel cousins are categorized as classificatory siblings, while Ju|’hoan kinship terms are classified as “Eskimo” type, in which sibling terms are different from cousin terms. The !Xun terminology is also classified as “bifurcate collateral,” in which kinship terms for a father’s siblings differ from those for a mother’s siblings, and the same terms are not applied to parents

Table 1. Ethnic background of the Ju|’hoan and !Xun.

	Ju ’hoan*	!Xun
Language	E1**	W2**
Research period	1960s	1998-2004
Residential pattern	nomadic	sedentary
Foraging	☉	△
Agriculture	△	☉
Piecework for agro-pastoralist	△	○

Source: *Lee (1979); **König & Heine (2001).

and their siblings. In contrast, the Ju|'hoan have a "lineal-type" terminology in which one term is employed for both father's brothers and mother's brothers, another term is employed for both father's sisters and mother's sisters, and the siblings of parents are distinguished from the parents themselves. In addition, the !Xun have a surname system called ||'honi, which is passed on by cross-descent: from father to daughter(s) and from mother to son(s). On the other hand, the Ju|'hoan do not have a surname system such as ||'honi.

There is also a clear division between these two societies in terms of their history. The Ju|'hoan adopted a nomadic lifestyle based on foraging activities in their semiarid environment. They lived in a number of semi-permanent or temporary village camps, each of which consists of 15 to 40 people. Within a camp, residents were related to one another through a wide variety of blood and marital ties (Konner, 1977: 288). They conducted their daily life in full view of relatives and friends and rarely saw a stranger. There were few physical or social barriers that restricted access of people to one another (Draper, 1976: 200-201). When a group in a camp moved, as they did for brief, subsistence-related trips and for more stable relocation, most of the group members usually stayed together (Konner, 1977: 288). Each band was separated by 5.0–50.0km (Draper, 1976: 200). In brief, the Ju|'hoan lived by traditional foraging techniques and kept *relatively* distant from other peoples, such as Herero and Tswana pastoralists, until approximately the 1960s, although there is active debate on the actual extent of their interaction with other people (Solway & Lee, 1990; Gordon & Douglas, 2000; Lee & Hitchcock, 2001).

By contrast, the !Xun have had close associations with the neighboring Owambo agro-pastoral people and have learned a sedentary lifestyle in which members cultivate crops and work for the Owambo for cash or in-kind (Takada, 2007; 2008a). The transformation of their society can be outlined as follows (see Takada, 2007). The San, possibly predecessors of the present-day !Xun, were the first inhabitants of northern Namibia. Bantu-speaking people, who later gave rise to the Owambo, are believed to have moved in from the north at the beginning of the first millennium A.D. and to have encountered the San near the Zambazi River (Williams, 1994: 32, 51-53, 73). The mutual dependence between the !Xun and Owambo strengthened over time. In the early twentieth century, South Africa started to dominate what is now north-central Namibia through so-called indirect rule, exploiting the area's people as a cheap labor source. The need for cash pushed both the Owambo and the !Xun into the southern part of the colony. In contrast, missionaries won the confidence of local people in northern Namibia, after many years of working toward this end. Most of the !Xun, who had previously lived in small-scale camps, started concentrating in mission-controlled villages in the 1950s. These villages developed flourishing agriculture systems. In the 1970s to 1980s, however, the "liberation movement" became active, and an intensifying war interrupted missionary work. During this period, the !Xun who had remained in north-central Namibia had to rely increasingly on foraging. After Namibian independence in 1990, fighters and refugees, including some !Xun, returned to north-central Namibia. Several

development programs were begun with high hopes of success. An important recent study, however, has reported that the status and situation of the !Xun has improved little (Susman, 2001).

METHOD

I conducted field research in southern Africa for two years and eight months in total. For the large part of that time I lived in Ekoka, a village established for the San by missionaries of the Evangelical Lutheran Ovambo/Kavango Church (ELOC). During the study period in 1998, Ekoka had a population of 169 !Xun (including !Xun speakers who were the descendants of intermarriages between !Xun speakers and Hai||om speakers).

The study is based on focal observations of caregiver–child interactions that occurred in natural settings during my field research in Ekoka in August of 2004. I used a check sheet to record interactions involving children from infancy up to the end of 4 years old. There were 17 children in this age range (three, four, three, three, and four children aged zero, one, two, three, and four, respectively)⁽³⁾ and I received cooperation from all of them and their parents. I conducted continuous observation of each focal child using 1-0 recording rule for 30-second intervals. Within each 30-second interval, behaviors were scored according to whether or not they had occurred. Table 2 shows the focal behaviors analyzed here. All variables were calculated as the percentage of bouts in which the focal behavior was recognized among the total observed bouts. Each child was observed for eight hours, which were divided into 960 bouts, distributed across 10 daylight hours. The daylight hours were broken into three parts (08:00 to 11:00, 11:00 to 15:00, and 15:00 to 18:00) and each part was sampled when the focal child was available. Each observation session lasted for 48 minutes, followed by a 12-minute rest period. When the focal children moved out of camp, I followed them.

I also used demographic data, which I obtained through hut-to-hut canvassing on foot in 1998, combined with statistical survey data collected by the

Table 2. Definition of focal behaviors.

Child behaviors

Child group interaction: behavior in which the child took part in the activity of a group of children that did not include adults

Class room activity: activity occurred in the room of the kindergarten

Suckling: suckling on a breast

Caregiver behaviors

Touching: being in physical contact with the child

Holding: holding the child

Gymnastic behavior: keeping the child standing or jumping

Feeding: feeding the infant (other than breastfeeding)

project officer of the “San Project” of the Ministry of Lands, Resettlement, and Rehabilitation (MLRR)⁽⁴⁾. The following is a preliminary report of the analysis.

RESULTS AND DISCUSSION

I. Location

Table 3 shows the location where caregiver-child interactions involving the focal children occurred. Notably, children less than 1 year old spent 63% of all bouts in a type of local bar called a “*cucashop*.”⁽⁵⁾ In contrast, the same children spent only 17% of all bouts around their hut. Their primary caretakers, usually mothers, visited the *cucashop* frequently, accompanied by their children. The *cucashop* served various kinds of items including bottled beverages, light meals (such as fried doughnuts and cooked meat), and local beverages made from pearl millet (*mahangu*) or sorghum. *Mahangu* is a major staple of both the Owambo and San in this area and is used to make porridge, soft drinks, and alcoholic beverages. A major use of sorghum is for the brewing of *tombo*, a local beer containing a relatively high percentage of alcohol. *Tombo*, which is relatively cheap (1-2 Namibian dollars=US\$ 0.13-0.26 per liter) and therefore accessible to poor people, including most of the !Xun, is a typical alcoholic beverage available at *cucashops*. The *cucashop* was also the major site of various social activities. For instance, people sometimes lingered at the *cucashop*, talking with relatives and friends for several hours without buying anything. Women and men, young and old, also often engaged in dance activities nearby the *cucashop*. Therefore, the *cucashop* provided children with a place for socialization. Children aged one, two, three, and four visited the *cucashop* for 49, 35, 16, and 44% of all bouts, respectively. Older children often stayed around their or a friend’s hut, even when their parents were outside the village, in the agricultural fields, or at the *cucashop*. Children aged one, two, three, and four remained around the huts for 32, 66, 50, and 38% of all bouts, respectively. In such cases, children often engaged in a group activity that did not include

Table 3. Location where caregiver-child interaction occurred.

Age group	n (m, f)*	Hut	<i>Cuca shop</i>	Kinder garten	Moving	Other
		mean (%)				
Zero	3 (3, 0)	17	63	0	20	5
One	4 (2, 2)	32	49	11	8	0
Two	3 (2, 1)	66	35	0	11	0
Three	3 (3, 0)	50	16	17	17	0
Four	4 (2, 2)	38	44	7	12	0

Note: *n=number, m=male, f=female.

adults. It was very common for the child group to move around the village. Group activity by children also occurred in the kindergarten built inside the village (see later section).

II. Caregiver–Child Bond

The extremely close mother–child bond is considered one of the most striking features of early interactions among the San. Konner (1977: 292-297) found that in the first months after birth, infants stayed in passive physical contact (excluding active touching by the infant) with their mothers for about 70% of the observational periods (all daylight hours). In the present study, “touch” is defined as behavior in which the caregiver is in physical contact with the child.⁽⁶⁾

Figure 1 shows that the tendency of the mother to touch her child decreased drastically with the age of the child. In the first year after birth (age group: zero), mothers were in physical contact with their infants in 62% of all bouts observed in daylight hours (08:00-18:00). In the second (age group: one), third (age group: two), fourth (age group: three), and fifth (age group: four) years after birth, touching declined to 28, 20, 7, and 4%, respectively. Konner (1977: 292-297) reported that the rate of mother–child physical contact declined gradually to about 30% by the middle of the child’s second year. My data show a similar trend, although the amount of touching by !Xun mothers is slightly lower than that by Ju|’hoan mothers. In addition, the developmental pattern differed across !Xun individuals.

The amount of touching by other caregivers did not show a clear relationship with the development of the child. In age group zero, touching by other caregivers was observed in 29% of all bouts, while in age groups one, two, three, and four caregiver touching was observed in 43, 38, 25, and 42% of bouts, respectively. Konner (1976: 222-228) reported the amount of passive physical contact with the mother, as well as with anyone including the mother. Therefore, we can estimate the amount of passive physical contact of Ju|’hoan

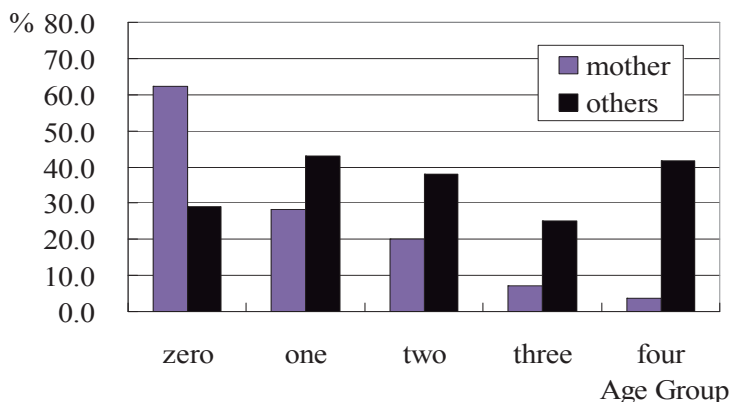


Fig. 1. Percentage of touch with child by the mother and other caregivers.

infants with people other than their mothers. In the first year after birth, infants were in physical contact with people other than their mothers for approximately 10–30% of all daylight hours. This trend is similar to that shown by my data for the !Xun.

Examination of the data by hour of the observed days showed no clear relationship between touching by mothers and time of day in age groups zero and one (Table 4). That is, young children were touched by their mother irrespective of the time of day. This shows that like Ju|'hoan children, !Xun young children also received frequent physical contact throughout the daytime. Meanwhile, children in age groups two, three, and four tended to be touched by their mothers more in the afternoon than before noon (Table 4). This suggests that children in these age groups often engaged in child-group interaction in the morning and then returned to mothers and other adults in the afternoon (see the sections of “I. Location,” and “V. Child-Group Interaction,” too).

For other caregivers, it was difficult to identify hourly trends because the extent of physical contact was quite high throughout the day (Table 4). Caregivers other than mothers were mainly siblings or cousins of the focal child, and most were female and resided with the focal child. Draper (1976: 209-214) reported that Ju|'hoan children were not required to contribute to providing subsistence or care for younger children. In contrast, !Xun children played a considerable role in these activities.

Holding by the mother and other caregivers followed a trend similar to that of touching, until the child's third year. At that time, the caregivers stopped holding the child (Fig. 2). In age group zero, holding by the mother was observed in 52% of all bouts. That is, mothers held the infants for more than half of daylight hours. In this age period, mothers usually carried the infants wherever they went, using a *kaross* (a cloak made of cloth or, traditionally, made of animal skin with the hair intact). When the children started unaided walking, holding by the mother declined. In age groups one and two, mothers held their children 19 and 12% of the observation time, respectively. In the fourth and fifth year after the birth, holding by the mother was rarely observed, declining to 1 and 0% in age groups three and four, respectively. While no clear trends were found in holding by the mother and time of day in age groups zero and one, children in age group two tended to be held by their mothers more in the afternoon than before noon (Table 4). This finding suggests that children in this age group, who typically had only recently been weaned, often participated in child-group interactions in the morning and then clung to their mothers, who were usually busy caring for a younger child or engaging in other activities, in the afternoon.

Regular physical contact between infants and mothers was also observed among the sedentary Baka, a group of Pygmy peoples (Hirasawa, 2005: 377-378). Mothers held their infants for an average of 85% of daylight hours until the infants reached six month of age. However, this pattern of continuous holding drastically decreased to 47% after seven months of age, when the infants became able to sit and to adjust their position independently. Holding time in

Table 4. Percentage of focal behaviors by hour.

		hour									
behavior	age group	8	9	10	11	12	13	14	15	16	17
Touch with child by the mother	Zero	78	80	46	64	69	74	63	59	51	39
	One	26	25	24	28	34	27	24	28	34	30
	Two	10	0	0	1	34	22	35	38	31	30
	Three	7	4	7	0	0	18	0	10	1	25
	Four	1	0	0	0	0	0	14	7	14	1
Touch with child by other caregivers	Zero	11	10	47	24	26	13	18	33	47	60
	One	44	25	33	48	54	44	48	52	34	48
	Two	33	32	74	29	24	43	36	44	33	32
	Three	14	24	36	32	19	31	30	26	15	23
	Four	25	30	47	52	38	42	54	36	54	39
Holding by the mother	Zero	62	72	37	57	60	61	55	39	45	38
	One	0	25	16	28	34	8	22	21	26	10
	Two	5	0	0	1	16	3	28	26	19	21
	Three	0	0	0	0	0	0	0	8	0	1
	Four	0	0	0	0	0	0	0	0	3	0
Holding by other caregivers	Zero	7	8	27	5	3	7	11	14	31	49
	One	6	5	9	32	29	10	24	7	8	11
	Two	1	6	40	8	2	2	13	42	5	1
	Three	0	0	4	0	5	0	9	0	2	8
	Four	0	0	0	0	0	0	0	0	2	0
Gymnastic behavior by mother	Zero	15	4	0	2	0	2	1	13	2	1
	One	0	0	0	0	0	0	0	0	1	0
	Two	0	0	0	0	0	0	0	0	0	0
	Three	0	0	0	0	0	0	0	0	0	0
	Four	0	0	0	0	0	0	0	0	0	0
Gymnastic behavior by other caregivers	Zero	1	0	4	8	4	1	1	2	11	4
	One	0	0	1	0	0	0	1	1	1	1
	Two	0	0	0	0	0	1	0	0	0	0
	Three	0	0	0	0	0	0	0	0	0	0
	Four	0	0	0	0	0	0	0	0	0	0
Suckling	Zero	16	8	1	16	8	11	7	5	15	6
	One	5	4	5	7	10	8	3	13	3	11
	Two	4	0	0	0	0	0	0	2	3	1
	Three	0	0	0	0	0	0	0	0	0	0
	Four	0	0	0	0	0	0	0	0	0	0
Feeding by mother	Zero	0	18	0	10	1	2	0	1	2	0
	One	2	6	2	6	0	0	6	4	5	8
	Two	1	2	0	9	33	1	11	4	6	3
	Three	0	0	14	0	0	0	0	1	0	14
	Four	0	0	0	0	1	0	4	0	1	1
Self-feeding	Zero	3	2	0	6	0	1	1	2	0	1
	One	2	1	1	4	1	0	0	1	0	0
	Two	3	8	2	5	1	2	0	0	0	8
	Three	6	4	1	0	1	0	0	0	3	2
	Four	0	2	1	0	19	0	0	3	6	3
Feeding by other caregivers	Zero	0	8	3	3	0	8	1	3	2	2
	One	10	8	18	5	1	11	18	8	9	16
	Two	21	26	2	24	1	3	1	1	5	3
	Three	8	2	10	6	7	11	0	1	0	14
	Four	17	0	4	0	9	3	2	2	7	1
Child group interaction	Zero	0	0	0	10	6	8	0	0	0	0
	One	33	42	25	20	21	19	25	0	6	22
	Two	22	65	58	54	33	33	33	33	38	34
	Three	42	55	63	73	73	67	92	63	47	3
	Four	65	84	98	80	44	83	61	30	15	67
Class room activity	Zero	0	0	0	0	0	0	0	0	0	0
	One	0	0	0	0	0	0	0	0	0	0
	Two	0	0	0	0	0	0	0	0	0	0
	Three	0	14	0	12	0	0	0	0	0	0
	Four	0	0	0	0	0	0	0	0	0	0

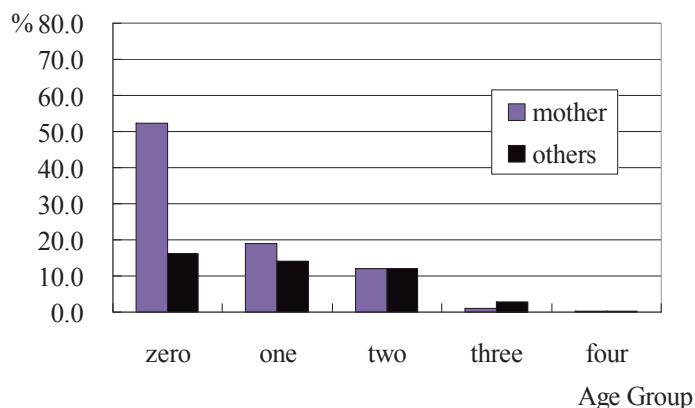


Fig. 2. Percentage of holding by the mother and other caregivers.

late infancy also showed considerable individual differences. In addition, among the Aka, another group of Pygmy peoples who actively engaged in net-hunting in the forest, mothers held their infants aged nine to ten months for 87% of daylight hours (Hewlett et al., 1998). In the context of these findings, Hirasawa (2005: 378) claimed that mothers' holding was strongly affected by the mobility of their activities. Mothers in the sedentary Baka culture no longer needed to hold their infants for as long as did those in other active foraging cultures.

Other caregivers held focal children in age groups zero, one, and two for 16, 14, and 12% of the observation time, respectively. This indicates that people other than mothers also considerably held children in this age range. As was the case in regard touching, these caregivers were mainly siblings or cousins of the focal child, and most were female and resided with the focal child.⁽⁷⁾ This is an example of allomaternal care, which has been widely observed in Pygmy societies. Among the Efe, a group of Pygmy peoples, for instance, an infant was transferred from caregiver to caregiver about eight times per hour (Tronick et al., 1992). Further, Hirasawa (2005) reported that among the Baka, another group of Pygmy peoples, mothers relied more on their older children, who were 6 to 10 years old, than on their husbands or other women who were not taking care of their own children. Hirasawa postulated that sedentarization and the introduction of cultivation reduced the unit size for production and consumption, and consequently the importance of children as caretakers of younger children increased (Hirasawa, 2005: 368-371). My data on allomaternal care provides evidence in support of this hypothesis.

I did not find any clear hourly trends regarding holding by other caregivers in the studied age groups (Table 4). In age groups three and four, holding by other caregivers was rarely observed (3 and 0%, respectively), similar to holding by mothers in the same age period.

III. Caregiving Behaviors

I have shown that caregivers among various groups of the San frequently

hold infants in standing or jumping positions on their laps, beginning several weeks after birth. I call this “gymnastic” behavior. !Xun caregivers also engage in gymnastic behavior, which usually lasts for several seconds to a few minutes at a time. I have postulated that gymnastic behavior is one of the major techniques used to soothe fretful infants before the onset of unaided walking (Takada, 2004; 2005b).

Figure 3 indicates that in the first year after birth, mothers engaged in gymnastic behavior in 4% of all bouts. Other caregivers also practiced gymnastic behavior in 4% of all bouts. These percentages indicate that caregivers including mothers engaged in gymnastic behavior several times per hour when the children were awake. As predicted, the practice of gymnastic behavior declined drastically when the child began to stand and walk. In age groups one to four, gymnastic behavior by mothers as well as by other caregivers decreased to less than 1%. Most caregivers had stopped engaging in gymnastic behavior completely by the time the child reached three years old.

Among the Ju|'hoan, the nursing of 12- to 139-week-old infants occurred for only about two minutes during each of four sessions per hour. Differences by infant age were not found according to the bout length or nursing time (Konner & Worthman, 1980). Figure 4 shows that among the !Xun, suckling was observed in 9, 7, and 1% of all bouts involving 0-, 1-, and 2-year-old children, respectively. In all cases, the mother breastfed her child. Similar to Ju|'hoan mothers, therefore, !Xun mothers nursed their infants briefly, usually for a few minutes at a time and frequently at short intervals. My previous analysis indicated that this breastfeeding pattern emerged from the following features. (1) Mothers could nurse infants at any time and in any location; (2) mothers nursed their infants to soothe them; (3) during suckling, mothers gazed at their infants less than usual; (4) gymnastic behavior sometimes interrupted breastfeeding; and (5) mothers seldom jiggled their infants after a break in suckling (Takada, 2005b).

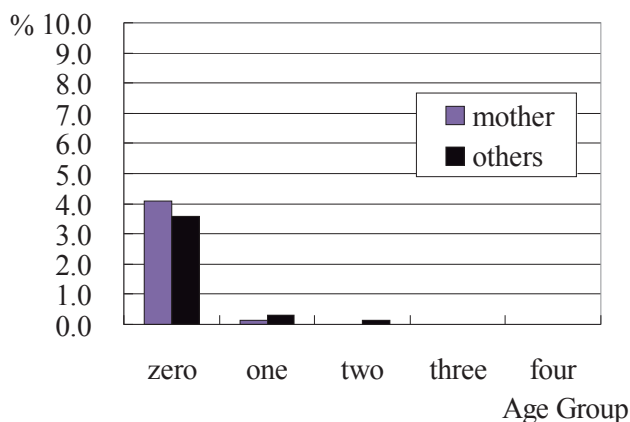


Fig. 3. Percentage of gymnastic behavior by mother and other caregivers.

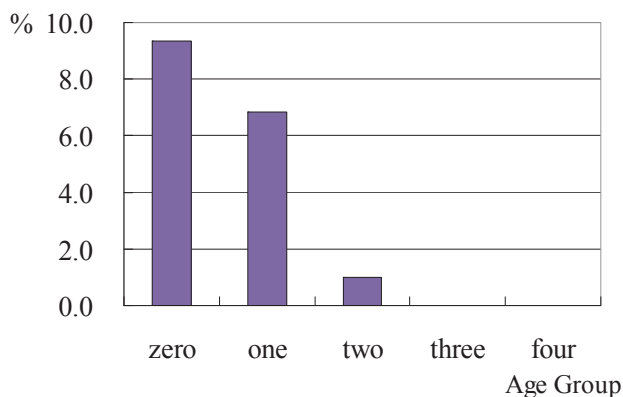


Fig. 4. Percentage of suckling.

The present study also demonstrates that young children were nursed by the mother irrespective of time of day: no hourly trend was shown in the data for age groups zero, one, and two (Table 4). Frequent, brief nursing at short intervals was observed across these age groups, although the nursing bouts tended to be progressively longer in older children.⁽⁸⁾

In a development resembling that observed in the sedentary !Xun, when Baka foragers became more sedentary, short nursing intervals, ranging from 30 to 60 minutes, remained characteristic throughout the first year after birth (Hirasawa, 2005: 371-375).

IV. Weaning and Subsistence

Konner (1977) observed that about three-fourths of Ju|'hoan children were nursed until they were two to three years old. If no younger siblings were born, nursing would usually continue until after age five (Konner, 1977: 292-293). In the meanwhile, as indicated in the previous section, !Xun children were weaned from breastfeeding earlier than their Ju|'hoan counterparts. This is particularly interesting when we consider the following data.

Figure 5 shows a comparison of parity by age group between Ekoka !Xun women in 1998 and Dobe Ju|'hoan women in 1968 (Howell, 2000). The number of children of !Xun women (including those in intermarriages involving !Xun speakers and Hai||om speakers) between ages 15 and 45 in 1998 was almost the same as or slightly lower than that of Ju|'hoan women in 1968. This result is interesting if we consider that the Dobe Ju|'hoan are known for their low birth rate, which has been explained in terms of their foraging lifestyle (Lee, 1979; Howell, 2000).⁽⁹⁾ One partial explanation may be that most young women of the Ekoka !Xun spent their fertile period during the tumultuous Namibian liberation movement of the 1970s and 1980s (Takada, 2008a). Accordingly, women over 45 years old, who spent their fertile period *before* the liberation movement, achieved higher fertility (on average, 7.8 and 6.1 children in 45–49 year olds and those over 50, respectively).

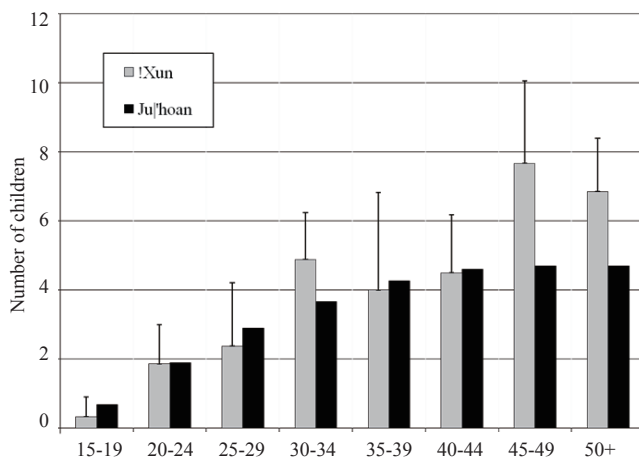


Fig. 5. Number of children according to age of women of !Xun ($n=43,1998$)* and Ju|'hoan ($n=62,1968$)*.*.

Left wide gray bar represents the mean number of children of !Xun women observed by the author. Error bar shows +1 SD. Right wide black bar represents the estimated number of children of Ju|'hoan women simulated by Howell (2000). Source: * Author, ** Howell (2000).

Moreover, Figure 6 demonstrates that regardless of the mother's next pregnancy, suckling ceased almost completely near the beginning of the third year after birth. The X-axis indicates the month-grade of the focal children, while the Y-axis indicates the percentage of bouts in which suckling was observed. The square icon represents a focal child whose mother was pregnant or had already had another baby, while the triangle represents a focal child whose mother was not pregnant and had not had another baby. As shown in Figure 6, mothers who were pregnant or had given birth to their next child did not breastfeed the focal children during my observations. Among children who did not have a younger sibling and whose mother was not pregnant, those in age groups three and four were not breastfed at all. Moreover, children of non-pregnant mothers in age group two were rarely breastfed. Suckling was observed in only 1, 2, and 0% of all bouts in 24-, 26-, and 29-month-old children, respectively. In addition, one 17-month-old child was breastfed in only 1% of all bouts, even though her mother was not pregnant yet. These findings indicate that suckling ceases almost completely at around the beginning of the third year after birth, regardless of the mother's next pregnancy. Taking Figures 5 and 6 together, the trend of earlier weaning among the !Xun cannot be attributed to shortening of the birth interval. Rather, it might be explained, at least partially, by the custom of providing young children with food and drink.

Mothers and other caregivers gave children various foods and drinks, including porridge, doughnuts, and soft drinks made from pearl millet. Figure 7 indicates that mothers started feeding their children these items when they were less than 1 year old. Feeding by the mother (other than with breast milk) was observed in 4% of all bouts in the zero age group and in 4, 7, 3, and 1% of all bouts involving 1-, 2-, 3-, and 4-year-old children, respectively. Note that

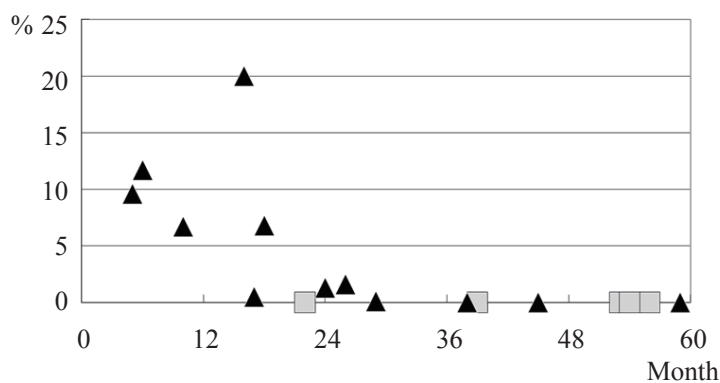


Fig. 6. Percentage of suckling by the mother's next pregnancy. The square icon represents a child whose mother was pregnant or had another baby, while the triangle represents a child whose mother was not pregnant and did not have another baby.

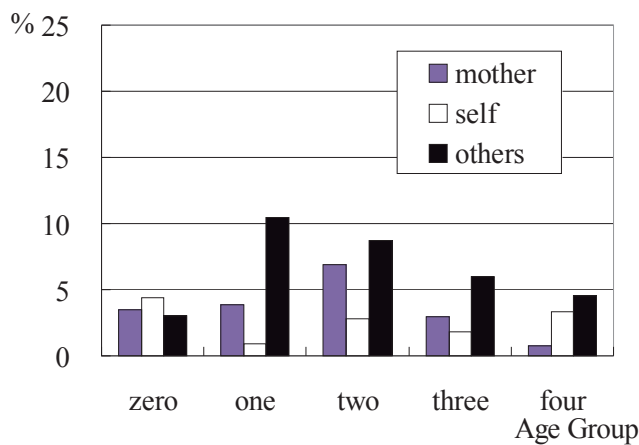


Fig. 7. Percentage of feeding by mother, child(self-feeding), and other caregivers.

mothers fed children of age group two the most, when suckling ceased almost completely.

Meanwhile, feeding by other caregivers was observed in 3, 11, 9, 6, and 5% of all bouts involving 0-, 1-, 2-, 3-, and 4-year-old children, respectively. That is, people other than mothers also started feeding the children foods other than mother's milk when they were less than 1 year old. Feeding by other caregivers increased drastically in the second year after birth and then slightly declined along with the growth of the children. Children also self-fed. Self-feeding was observed in 5, 1, 3, 2, and 3% of all bouts involving 0-, 1-, 2-, 3-, and 4-year-old children, respectively. However, it is difficult to identify clear trends regarding self-feeding because the amount of self-feeding was scarce throughout this age range.

By hour of the observed days, the data showed no apparent hourly trends

regarding feeding by the mother, by other caregivers, or by self-feeding (Table 4). These data suggest that !Xun caregivers feed children whenever they become fretful.

In summary, among the present-day !Xun, mothers and other caregivers started feeding their children items other than mother's milk when they were less than 1 year old. Thereafter, a transition from breastfeeding to solid baby food occurred in the second year after birth, regardless of the mother's next pregnancy. The data from this study suggest that other than mothers, individuals who themselves cannot provide breast milk were most active in feeding children solid foods in the beginning of the weaning period and after the mothers stopped breastfeeding completely.

Similar trends were also observed among the Baka, who had adapted to a sedentary lifestyle. Like that among the !Xun, the nursing period among the sedentary Baka decreased. Most infants were weaned at about age two. Caregivers gave them plantain or wild yam mashed by hand (Hirasawa, 2005: 371-373). Among the Ju!'hoan, supplementing nursing with a wide range of foods, sometimes premasticated food, was also observed to begin around the age of six months (Konner, 1977: 292). However, Ju!'hoan mothers continued breastfeeding until the children were three or four years old, or until the mother became pregnant again (Konner 1977: 290-292; Draper 1976: 214-215).

Previous studies have indicated that one of the reasons for late weaning among the Ju!'hoan is that solid foods suitable for babies were unavailable or limited because of their foraging subsistence pattern. In contrast, the !Xun have had close associations with Owambo agro-pastoralists, who have various infant foods, such as porridge, cattle milk, and soft drinks made from pearl millet. In addition, I observed a case in which a mother put a bitter grass paste on her nipples to facilitate weaning of her 10-month-old baby. The Owambo have a similar custom.⁽¹⁰⁾ Therefore, it is plausible that the earlier weaning by the !Xun has been facilitated by the development of a sedentary lifestyle, accompanying close contact with the Owambo.

V. Child-Group Interaction

Konner (1977: 290) pointed out that when the close mother-child relationship declined, Ju!'hoan children began to switch from a strong attachment to the mother to an attachment to a multi-aged child group. According to Draper (1976: 202-203), the average number of children per band consisted of five girls and seven boys ranging from infancy to 14 years. Several age-mates were usually not available. A similar trend was also observed among !Xun children. I defined "child-group interaction" as behavior in which the focal child took part in the activity of a group of children that did not include adults. These activities nurture the *children's culture*, allowing children active roles in shaping their own interactions and experiences (Kamei, 2005).

Figure 8 shows that child-group interactions increased continuously with the age of the child. In the zero age group, child-group interactions were rarely

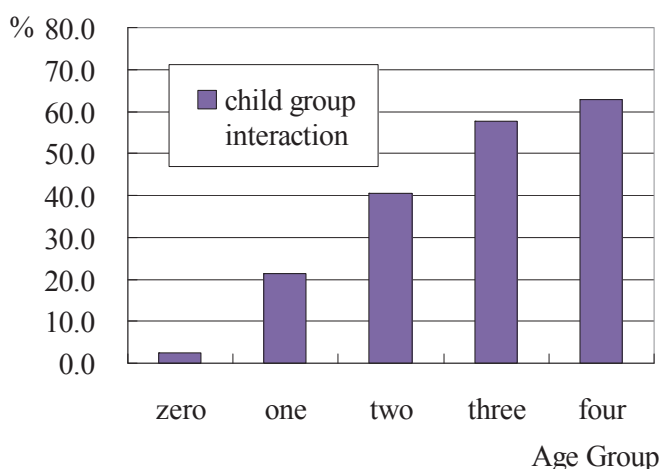


Fig. 8. Percentage of child group interaction.

observed, in only 2% of all bouts. However, in the second year after birth, the focal children began to participate in the activities of the group of children. Child-group interactions were observed in 21% of all bouts in the age group one. The percentage of child-group interactions increased to 41% in the age group two, 58% in the age group three, and then to 63% in the age group four. Thus older children spent most of the daylight hours with a group of children.

It has been established that Ju!hoan child groups rarely engaged in foraging activities or daily chores. Children under age six were observed performing a task for an average of less than one minute per hour. Children under age six performed an average of less than one child-caring act per hour (Konner, 1977: 290). In these respects, activities performed by !Xun child groups differed considerably from those performed by their Ju!hoan counterparts. As a result of earlier weaning, toddlers among the !Xun often participated in multi-aged child groups. Older siblings or cousins habitually took care of these youngsters. Further analysis showed that older siblings or cousins often took younger children to participate in a multi-aged child group. Initially, the youngsters often clung to their older siblings or cousins, but they gradually broadened their range of social activities. The multi-aged child group provided a place and opportunity for socialization. Additionally, older children (usually over five years old) often engaged in routine housework, such as processing *mahangu* powder by pounding the crop seeds with a wooden mortar and pestle.

Child-group interactions tended to occur more before noon (Table 4), and interactions often occurred around the kindergarten founded in the village. It should be mentioned that as part of the "Project Mobilization and Empowerment for Poverty Reduction" program targeting Ohangwena in north-central Namibia, UNESCO has provided support for activities such as handicraft production and sales, agriculture, and leadership development, with a primary focus on the San. Special attention has been given to the cultural rights of indigenous people

in the context of the United Nations' "International Decade of the World's Indigenous People 1995–2004." Moreover, UNESCO has viewed the San as "the most dispossessed and ignored group" in this area (Berger & Zimprich-Mazive, 2002: 5-7). Along with these activities, UNESCO and the government embarked on a project to encourage education of young San children in 2001. Later, with financial support by the United States Agency for International Development (USAID), the project developed into the Kindergarten Project, in which San and Owambo children were sent to the same kindergartens.⁽¹¹⁾ UNESCO, in cooperation with a local nongovernmental organization (NGO), established several kindergarten sites, including one in Ekoka.

The project assumed that ethnic exclusion or discrimination should be reduced and that children could nourish personal friendships across ethnic groups from an early age. The project officers tried to gain local support and understanding for the project by explaining the project aims to local residents. For each kindergarten, the project recruited two teachers and two caretakers from local residents (mostly San adults).

However, the teachers were not eager to hold scheduled classes. This was partly because the teachers were recruited without receiving sufficient education or training. The classroom activities programmed before noon were rarely recognized. Instead, the children often played in an open space near the kindergarten building during my research period in 2004. The focal children, particularly those in age groups three and four, were also expected to attend the kindergarten class. However, I observed children in the age group three actually taking part in classroom activities in only 3% of all bouts. In the other age groups studied here, no classroom activity was observed (Fig. 9).

Hence, although the project increased opportunities for contact among children across several ethnic groups in the area, the children still tended to gather in their residential groups. In addition, as most of the older children did not go to school, the groups of children usually consisted of multi-aged children.

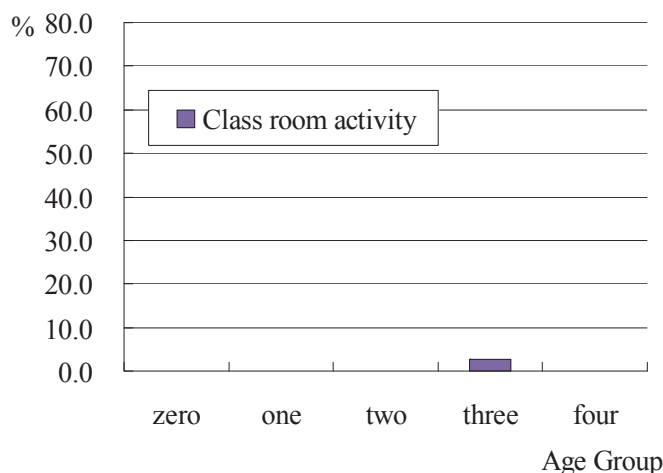


Fig. 9. Percentage of class room activity.

In brief, the project has not greatly changed the distinct pattern of early social interaction.

CONCLUDING REMARKS

Our main concern in this paper is to examine the cultural variety of caregiver-child interactions among the San, as well as to reconsider the relationship among ecology and subsistence patterns, parental ideology, and the pattern of caregiver-child interactions. We close this paper by refocusing on the themes that underlie the preceding analyses.

In summary, similarities between the !Xun in 2004 and the Jul'hoan in the 1960s with regard to caregiver-child interactions include: (1) close mother-child bonding (see the section of "II. Caregiver-Child Bond"); (2) frequent practice of gymnastic behavior (see the section of "III. Caregiving Behaviors"); (3) brief nursing periods occurring following short intervals (see the section of "III. Caregiving Behaviors"); (4) low birth rates (IV. Weaning and Subsistence); and, (5) socialization in multi-aged child groups (I. Location, and V. Child-Group Interaction). In contrast, the following features were observed among the !Xun but not reported about the Jul'hoan: (6) habitual childcare by siblings or cousins (II. Caregiver-Child Bond, and V. Child-Group Interaction); (7) weaning in the second year after the birth (III. Caregiving Behaviors, and IV. Weaning and Subsistence); (8) providing young children with abundant solid foods (IV. Weaning and Subsistence); and, (9) participation of toddlers in multi-aged child groups (V. Child-Group Interaction).

These observations not only enrich our profiles of caregiver-child interactions among the San, but also update our understanding of the relationships among ecology and subsistence patterns, parental ideology, and patterns characterizing caregiver-child interactions. As noted above, a number of studies adopting "adaptationist" approaches in reconstructing human nature have assumed a cause-and-effect model among ecology and subsistence patterns, parental ideology, and patterns of caregiver-child interactions. However, my observations revealed mixed findings in this vein. (6) habitual childcare by siblings or cousins, (7) early weaning from the breast, and (8) providing young children with abundant solid foods were predicted from other studies, and this held true in my study, at least to some extent. (9) Participation of toddlers in a multi-aged child group represents one logical consequence of these changes. Nevertheless, several findings did not accord with the expectation from the previous studies. Despite the difference in subsistence patterns, (1) the developmental transition of touching and holding by the mother was similar in the Jul'hoan and !Xun. (2) Gymnastic exercise involving children who could not yet walk unaided, (3) the frequent nursing with short intervals, and (5) socialization in a multi-aged child group also persisted, even among the sedentary !Xun. In addition, (4) the trend of parity in sedentary !Xun women was quite similar to that of nomadic Jul'hoan women.

The !Xun are closely resembled with the Baka when it comes to the impact of sedentarization and subsistence farming, for both groups are characterized by (6) habitual childcare by sibling or cousins and (7) early weaning, despite the large disparity of their ecological settings (semi arid desert for the !Xun and tropical forest for the Baka). Along with Hirasawa (2005: 368-371, 377-378), it is plausible that, in both groups, habitual childcare by sibling or cousins was facilitated by the decrease of mobility of mothers' activities as well as the reduced unit size for production and consumption. I also postulated that early weaning was derived by the development of a sedentary lifestyle, particularly introducing (8) various solid foods for infants, accompanying close contact with the neighboring agro-pastoralists.

My studies to date suggest that other persistent features, namely, (1) close mother-child bond, (2) frequent practices of gymnastic behavior, (3) brief nursing at short intervals, and (5) socialization in a multi-aged child group, are closely linked with each other in the sequential organization and participation framework of their caregiver-child interactions. Along this line, I have proposed that the language socialization approach, which examines how each community's habitus of communicative code, practices, and strategies is related to its socio-cultural logic (Ochs et al., 2005: 548), provides a powerful perspective (Takada, 2005a). Through this approach, we can inquire into the processes of behavior transmission and pattern modification in the realm of caregiver-child interaction.

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NOTES

- (1) Many publications have applied the term !Kung to this group. However, I use the term "Ju|'hoan," which is their self-designation, to distinguish them from the !Xun (see below). Studies have increasingly adopted the term Ju|'hoan or its plural, Ju|'hoansi (cf. Lee, 1993).
- (2) For detailed ethnographic backgrounds, see Takada (2007) for the !Xun living in north-central Namibia and Lee (1979; 1993) for the Ju|'hoan.
- (3) Because of the small sample size, gender differences are not analyzed in this paper.
- (4) I am grateful to MLRR officer Mr. N. Shapwa, who kindly allowed me to refer to his official data on the estimated age of Ekoka residents.
- (5) Most *cucashops* are run by relatively rich farmers or civil servants such as teachers. Managing a *cucashop* provides an important source of cash income in northern Namibia.
- (6) It should be noted that Konner (1976; 1977) reported data for *passive physical contact* only, excluding active touching by the infant. In contrast, I did not discriminate

- between passive and active physical contact.
- (7) I have not yet fully analyzed the detailed relationship between the focal children and caregivers other than mothers.
 - (8) Details of the breastfeeding patterns described by this data set have not yet been fully analyzed.
 - (9) Due caution is necessary in the interpretation of this result because I used direct observational data for the number of children of !Xun women, while I used the simulated estimation by Howell (2000) for that of Ju!'hoan women.
 - (10) Details of this custom have not been fully analyzed yet.
 - (11) Recently, UNESCO broadened the age range of the focal children involved in the project in order to provide follow-up support for children who had already participated.

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Author's Name and Address: Akira TAKADA, *Graduate School of Asian and African Area Studies, Kyoto University, 46 Shimoadachicho, Yoshida, Sakyo-ku, Kyoto 606-8501, JAPAN.*
E-mail: takada@jambo.africa.kyoto-u.ac.jp

